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THE FLAXSEED PRIMER

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THE FLAXSEED PRIMER

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Flax is a comparatively new crop in Texas and has been confined largely to South Texas where it is grown in the winter. Its production has extended farther north during the last few years. In 1938, the first year of commercial production in Texas, only about 1,000 acres of flax were harvested, but the acreage increased steadily until 1949 when 329,000 acres were harvested. This one crop was valued at more than six million dollars. The acreage and yield have fallen off somewhat since 1949 as a result of unfavorable weather conditions.

USES OF FLAX

The main products from flax are linseed oil, linseed meal and fiber. Linseed oil is used in the manufacture of paints, varnishes, linoleum, oilcloth, patent leather, printer's ink, washable wallpaper, as a core oil in foundries, and for many other purposes. Linseed meal is an excellent protein feed, similar to cottonseed meal. It is especially valuable for beef cattle, dairy cattle and sheep. Fiber from flax straw is used in making cigarette paper, Bible paper, fine writing paper, carbon paper, currency and other kinds of paper where strength and durability are desired. In Texas, however, the straw is not saved since there are no fiber processing plants in the State. Tall-stemmed fiber flax varieties for making linen are grown in Europe and on a small scale in Northwestern United States.

FLAX VARIETIES

The leading flax varieties grown in Texas are Deoro, B-5128, Golden (Viking), Rio and Turkey. Minor varieties are Dakota, Imperial, Maritime, Norsk and Linda.

Deoro, also known as New Golden, is a new variety derived from Golden. It is a little taller and later and also a higher yielder than the Golden.

B-5128 is a tall, good yielding, medium early variety. It has blue flowers and brown seeds. It was selected from a cross between Golden and Rio.

Golden which is also known as Viking is an early variety with shorter stems than B-5128. It has pale pink flowers and yellow seed.

Rio is of medium height to tall and later in maturity than Deoro, B-5128 and Golden. It has blue

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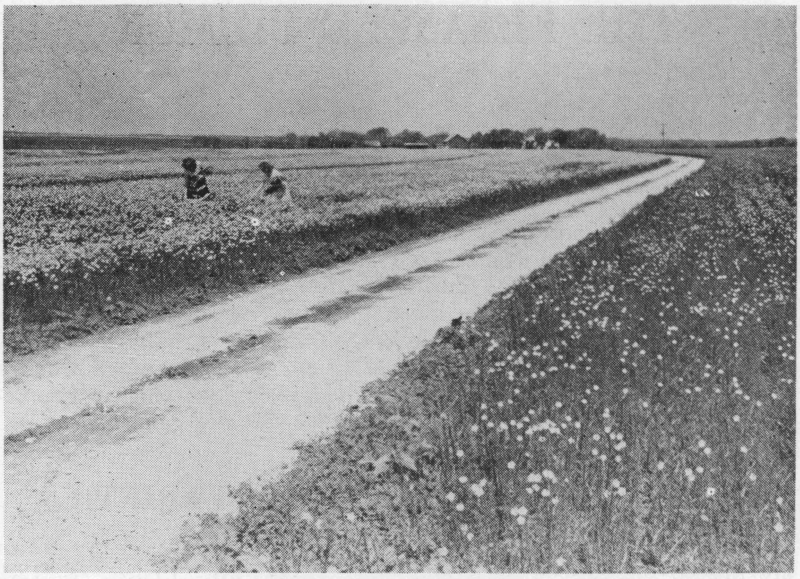


A field of flax in bloom.

flowers, large brown seed and moisture-resistant bolls.

Turkey (C. I. 862) and *Turkey Selection 417* are late maturing winter-type varieties.

They are very resistant to cold after they pass into the rosette stage. This is the early branching stage of Turkey and other winter type varieties during which the stems lie flat on the ground. Because of their winter hardiness, they are recommended for fall seeding from Karnes County to as far north as Austin.

Dakota, Imperial and *Maritime* are grown only to a small extent. They are earlier, but not so cold resistant as most of the other standard varieties.

Norsk is a very early variety adapted to fall seeding in the Lower Rio Grande Valley and to emergency spring seeding farther north. It has little cold resistance.

Linda is a new, early maturing variety that appears promising for fall seeding in the southern part of the Coastal Bend area and for spring seeding in the northern producing area of Texas.

FLAXSEED PRODUCING AREAS OF TEXAS

At present, there are three rather distinct flaxseed producing areas in Texas: (1) the southern, or Coastal Bend area, (2) the central area and (3) the northern area. The varieties grown, cultural methods used and hazards involved differ for these areas.

The Southern or Coastal Bend Area: This area extends from

about Kingsville on the south to central Wilson and Atascosa counties on the north. In this area, the northern spring-type varieties, mainly Deoro, B-5128, Golden (Viking) and Rio are grown from fall seeding. Most of the seed for planting are shipped in from the flax-producing states in the North.

The Central Area: This area extends from central Wilson and Atascosa counties north into the central Blacklands about as far as Austin, with possibilities of extending to Bell County or beyond when seed of recently developed winter-hardy varieties become available. In this area, only the winter-type varieties such as Turkey (C.I. 862) and Turkey Selection 417 are sufficiently cold-resistant to survive the average winter with good stands.

Spring seeding of spring-type varieties such as B-5128, Deoro and Golden usually is not successful in the central area, since the crop often makes poor growth and encounters hot weather during the blooming and filling period, which reduces the yield.

Planting seed of the winter-type Turkey varieties for this area must be home-grown, since they cannot be grown successfully in the North. Seed stocks of these Turkey varieties have practically been eliminated as a result of unfavorable weather conditions extending over a period of two or more years.

The Northern Area: The northern area at present centers around Brown, Coleman and McCulloch counties, with possibilities of extending much farther north. In this area, spring seeding of spring-type varieties B-5128, Deoro and Golden and probably Linda is practical. The varieties commonly grown at present are the same as those grown from fall seeding in

A difference of cold-resistant varieties is shown in this picture. Norsk and Punjab in center were killed by a freeze, while more hardy Rio on left and Golden on right survived.

the southern area. It is probable, however, that earlier-maturing varieties can be found that will give better results. This may necessitate home production of planting seed since very early-maturing varieties usually are not high seed producers in the north.

SOIL PREPARATION

Flax can be grown on any good farm land ranging from sandy loam to heavy blackland. The land should be plowed as far ahead of seeding as possible so that it can store the moisture from any rains that may fall. The more moisture stored in the soil the better the chance of making a good crop. Subsoil moisture is an important reservoir to draw on, especially during a dry winter.

Left, Turkey variety of flax shows rosette or prostrate type of winter growth, compared with the upright type which is less winter hardy. The Turkey variety in the rosette stage can stand severe cold.

Where flax follows flax or some other winter crop, the land should be plowed as soon as the crop has been harvested and then kept free of weeds until seeding time. If it follows a crop of summer legumes such as guar or cowpeas or a crop of cotton or grain sorghum, the crop residue should be turned under as soon as possible so that it can rot before flax seeding time and the soil be allowed to store up moisture from early fall rains.

Flax usually can be grown following flax with good results for several years if sufficient attention is given to weed control. Where the straw is plowed under early so that it can rot, the flax crop succeeds well following flax. Many farmers consider the flax plant a good soil conditioner because of its extensive and rather deep root system, which has a tendency to loosen the soil. Flax also follows winter grains such as oats or barley very well if the land is plowed immediately after the grain is harvested and then kept free of weeds and volunteer grain during the summer and early fall. Many farmers follow flax with a summer legume such as guar or cowpeas for soil improvement.

FERTILIZERS

Most of the soils in which flax is grown, especially the sandy and sandy loam types, need extra plant food for maximum yields. On old Blackland soils, an application of 200 pounds of 10-10-0 or 150 pounds of 16-20-0 per acre is suggested. On the sandy loam soils, 400 pounds per acre of 5-10-5, or its equivalent in higher grades,

A sample of flax seed is taken from a truck with a sampling probe. By taking seed with the probe down to the floor in different parts of the truck a representative sample is obtained. This sample is then tested for moisture, weed seed, trash and other foreign material.

should give good results. Flax, like other crops, will respond better to fertilizers in years with good rainfall than during dry years.

The fertilizer may be applied with a combination seed and fertilizer drill.

SEED TREATMENT

Chemical treatment of flaxseed before planting should be a standard practice. It protects the seeds, sprouts, and young seedlings from various soil and seed-borne organisms that may cause seed decay or "damping-off" of the young plants. Seed treatment also may help to control pasmo, since the spores of this disease are sometimes carried on the seed. Planting seed should first be cleaned thoroughly, and then treated with Ceresan M at the rate of one ounce per bushel. The dust should be mixed thoroughly with the seed about 24 hours before seeding. Caution: The chemical is poisonous. Treated seed must not be fed to livestock or sold for processing.

TIME OF SEEDING

The Coastal Bend Area: Flax seeding in Texas should be timed

so as to escape damage from frost in both the seedling and blooming stages and have the crop mature ahead of hot weather. The best time to sow the principal varieties, Deoro, B-5128 and Golden (Viking) in the Coastal Bend area in South Texas, is from about November 1 to December 20. If sown earlier the flax may reach the bloom stage in February at which time it may be seriously injured by cold weather. If sown later it may be caught by a killing frost before it is past the two-leaf stage. Flax is very tender until it has passed the two-leaf stage and again while it is in bloom.

While November 1 to December 20 is the best time to sow the varieties grown in South Texas, it is not always possible to get the plants up if the soil is too dry. In such a case, it may be better to sow later, but not after January 20, and take a chance on the weather. After this date, the cool season is too short for the plants to make good growth and develop the seed crop ahead of hot weather.

In the Central Area where the winters are colder and killing frosts come earlier in the fall, it is important to sow sooner than is best farther south. In this area, early seeding (October 1 to November 1), so as to escape frost injury in the seedling stage, will not bring the plants into bloom too early in the spring. The varieties grown here are of the winter-type and remain in the hardy rosette stage until danger of spring frost is practically past.

In the Northern Area where the winters are too severe for survival of the most hardy varieties, spring seeding is essential. Here the big problem is to sow late enough to escape spring frosts and early enough to have the crop mature ahead of excessively hot weather. Often it is impossible to avoid both hazards. But experience has demonstrated that it is better to take chances with spring frost than with summer heat, since, if frost kills the crop, the land is still available immediately for any one of several summer crops. For this reason, the custom of seeding two or three weeks ahead of the average date of the last killing spring frost appears to be the safest practice. This date would fall between February 20 and March 20.

If moisture conditions are favorable, seeding at the beginning of a cold norther is a good practice for several reasons. The cold waves that bring the late spring frosts usually occur at least 10 days apart. The tender two-leaf seedling stage lasts only 2 or 3 days. Since flax seed sown under favorable conditions will emerge in 5 days, this gives the seedlings ample time to grow out of the two-leaf stage before the next cold spell arrives. Furthermore, seed that germinate and emerge under cool soil conditions develop plants with short, thick, sturdy stems with low first leaves and crowns. These characteristics make the seedling plants more resistant to such hazards as frost, wind whipping and sand damage than are plants that germinate and emerge under warm soil conditions.

METHOD AND RATE OF SEEDING

Flax is usually seeded with a grain drill. A good rate of seeding is 2 pecks (28 pounds) per acre except in the drier areas where 20 to 25 pounds are sufficient. These rates are for seed with at least 80 percent germination. If the germination is lower the seeding rate should be increased accordingly.

The seed are small and should be sown shallow, from ½ inch to 2 inches deep. In firm, moist soil, seeding about one inch deep is good practice. In sandy loam soil, or where the surface of the soil is dry, the seed may be sown 2 inches deep, in moist soil. They should never be sown deeper than 2 inches.

If the soil is not firm at seeding time it is best to firm it before seeding with a culti-packer or a roller of some kind to get quicker and better germination. Drills equipped with press wheels give good results on sandy soils when the surface is dry enough to crumble.

Seeding In Rows: In dry years, and on weed-infested soils, drilling in rows so the crop can be cultivated with standard farm equipment often gives higher yields than with solid seeding. Flax may be drilled in either 26 to 40-inch rows for cultivating with regular cotton or corn cultivators, or in 16-inch twin rows for cultivating with vegetable cultivators. In either case, a "spreader" at the bottom of the seed spout or opener is usually used to spread the seed 3 to 6 inches wide in the row. Row drilling requires only 12 to 16 pounds of seed per acre, or about half as much as solid seeding. Only one or two cultivations are required to control weeds between the rows. The thick stand of flax holds down the growth of weeds in the rows.

WEEDS

Fields intended for flax should be kept free of weeds. Follow a system of cropping that will not allow weeds to go to seed on the land for at least two years before the flax is grown. Weeds not only rob the flax plants of badly needed water and plant food but also interfere with the growth and harvesting of the crop. It is a good plan to keep the land semi-fallow through the summer before seeding, not allowing weeds to grow over 3 or 4 inches high between cultivations. Fallowing will allow the soil to store up summer and early fall rains ahead of flax seeding time. This extra subsoil moisture is important to insure a good crop. Another good method is to grow flax after a clean cultivated row crop, especially summer legumes such as guar, mung beans or cowpeas planted in rows and kept free of weeds. The legumes add organic matter and store extra nitrogen in the soil when plowed under.

Chemical treatment to kill weeds in flax fields is used by many growers but great care should be taken not to damage the flax or other susceptible plants growing in the vicinity, especially cotton and winter vegetables. The best time to use chemicals is while the weeds and flax are small and never after the flax has formed flower buds. Follow closely the directions of the manufacturer of the chemical used.

DISEASES

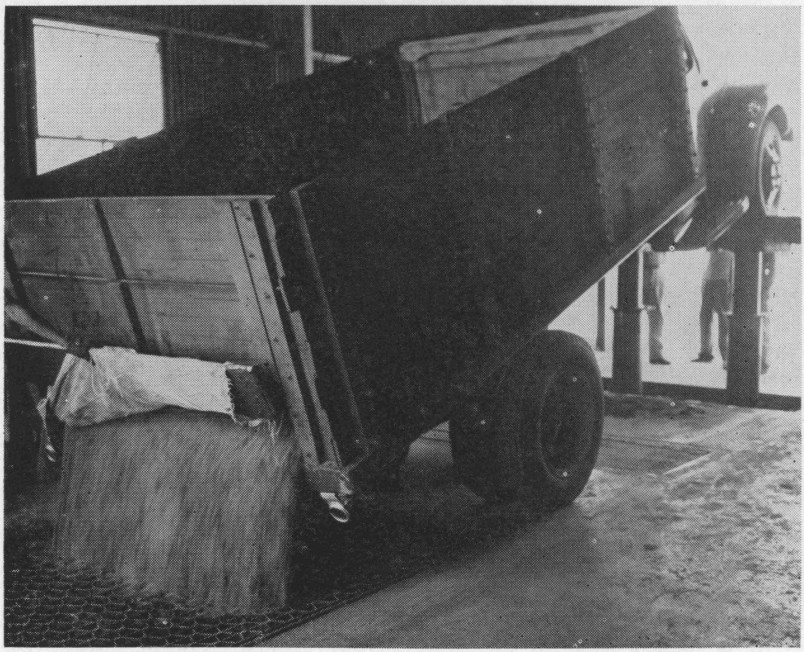
Flax is subject to several diseases, but fortunately they cause little serious damage in Texas. *Rust and wilt* were bad flax diseases until resistant varieties were developed. Most of the present standard varieties, including Deoro, B-5128, Golden, and Rio, are resistant to both rust and wilt. *Seedling blight* or "damping off" caused by various organisms sometimes occurs in Texas. Crop rotation and seed treatment helps to control it.

Pasmo is a fungus disease that sometimes causes considerable damage when conditions are favorable for its development. It causes elongated brown spots on the stems and yellow to brownish spots on the leaves when the plants begin to mature. Affected plants have a brown or mottled appearance. The disease causes the plants to ripen too early, which often results in brown spots in a field. No resistant varieties are available but breeding for resistance is in progress.

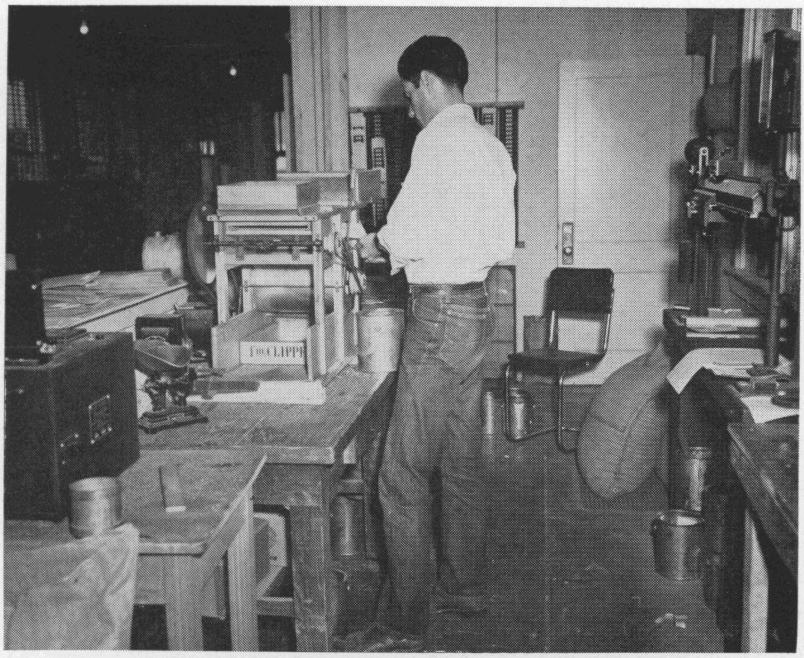
Rotation of crops and planting disease-free seed helps to control the disease. Chemical seed treatment also is helpful.

INSECTS

A number of insects attack the flax crop in Texas, but they usually do not cause wide-spread injury. Armyworms and cotton bollworms (corn earworms) occasion-



The flax seed is dumped from a truck and then conveyed to the drying plant and elevators.



The machine on the left is an electric moisture tester. This man is finding out how much dockage (foreign material) the seed contains. On the right is a scale for weighing truck loads. The platform of the scale is on the outside.

ally do some damage in late-sown fields by eating the flowers and green bolls. Small fields sometimes are attacked by stink bugs which migrate from adjoining uncropped land. These insects puncture the bolls and suck the juices from the developing seeds. White grubs and wireworms occasionally damage the plants by feeding on the roots. Cutworms and grasshoppers may devour the seedlings around the edges of fields. Crop rotation and clean cultivation of the land for several months previous to planting will help to control most of these insects. In case of damaging outbreaks, see your county agent.

HARVESTING

The common methods of harvesting flax in Texas are direct combining and windrowing. Direct combining is the quickest and cheapest method when the field matures evenly and is not weedy. When the field is weedy or matures unevenly, it is better to windrow the crop before threshing. Windrowing should be done when about 90 percent of the bolls are brown.

It pays to adjust the combine according to the dryness of the flax. Faster cylinder speed and closer setting is usually needed during the morning than in the

afternoon when the flax is drier. Where the acreage is small and the grower has his own harvesting machinery, it is a good plan to do the windrowing and hauling of the seed to market in the forenoons and the threshing in the afternoons when the seed and bolls are drier. Flax should not be threshed unless the bolls are open at the tip and dry enough to rattle in the wind.

HANDLING PLANTING SEED

Flaxseed for sowing must be harvested and handled carefully. It is best to wait for a dry afternoon when the seed have a low moisture content. Cracking of the seed and other damage which will lower germination can be reduced by equipping the combine with rubber rollers.

Flax planting seed carried over on the farm should be stored in jute bags and stacked criss-crossed in a cool, well ventilated building. Either wooden, metal or tile buildings are suitable for seed storage. The seed should be inspected regularly for insects. If controls are necessary, see your county agent.

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